

CLAIMS

1. A substrate for a perpendicular magnetic recording hard disk medium, comprising

an Si single crystal substrate having a diameter of 65 mm or less, a thickness of 1 mm or less and an average surface roughness (Rms) of 1 nm or more and 1000 nm or less;

an under-plated layer formed on said substrate, the under-plated layer comprising one or more metals selected from a group consisting of Ni, Cu and Ag and having a thickness of 1 nm to 300 nm;

and a plated soft magnetic layer formed on said under-plated layer, the plated soft magnetic layer having a thickness of 50 nm or more and less than 1000 nm, coercivity of 20 Oe(oersteds) or less and a saturation magnetization of 1T or more,

wherein the average surface roughness (Rms) of said plated soft magnetic layer is 0.1 nm or more and 5 nm or less.

2. The substrate for a perpendicular magnetic recording hard disk medium according to Claim 1, having induced anisotropy on the surface thereof.

3. A method for producing a substrate for a perpendicular magnetic recording hard disk medium, comprising steps of

carrying out under-plating to form an under-plated layer comprising one or more metals selected from a group

consisting of Ni, Cu and Ag on an Si single crystal substrate having a diameter of 65 mm or less, a thickness of 1 mm or less and an average surface roughness (Rms) of 1 nm or more and 1000 nm or less;

forming a plated soft magnetic layer having coercivity of 20 Oe(oersteds) or less and a saturation magnetization of 1T or more on said under-plated layer;

and polishing said plated soft magnetic layer so as to have an average surface roughness (Rms) of 0.1 nm or more and 5 nm or less.

4. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, comprising a pretreatment step of etching said Si single crystal substrate preceding the step of carrying out the under-plating.

5. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, wherein the step of carrying out the under-plating comprises electroless plating.

6. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, wherein the pretreatment step comprises chemically etching the Si single crystal substrate.

7. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according

to Claim 4, wherein the pretreatment step comprises etching in an alkaline aqueous solution comprising one or more selected from the group consisting of NaOH, KOH and ammonia.

8. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 4, wherein the pretreatment step comprises etching in an acidic aqueous solution comprising one or more selected from the group consisting of hydrofluoric acid, hydrochloric acid and nitric acid.

9. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, wherein said substrate has induced anisotropy on the surface thereof.

10. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, wherein said step of forming said plated soft magnetic layer is carried out in a magnetic field having an intensity of 10 G or more and 1000 G or less.

11. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, preceding the step of carrying out the under-plating, comprising a step of mirror-polishing said Si single crystal substrate and a subsequent pretreatment step of etching in a mixed aqueous solution of ammonia and hydrogen peroxide.

12. The method for producing a substrate for a perpendicular magnetic recording hard disk medium according to Claim 3, wherein the step of forming said plated soft magnetic layer comprises electroless plating.